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Paul J Farrell  
Dilworth & Barrese  
333 Earle Ovington Blvd  
Uniondale, NY 11553

EXAMINER

KUMAR, PANKAJ

ART UNIT

PAPER NUMBER

2631

DATE MAILED: 01/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/497,743

Applicant(s)

KIM ET AL.

Examiner

Pankaj Kumar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4 and 7-11 is/are rejected.
- 7) ☒ Claim(s) 2,3,5 and 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**1. DETAILED ACTION**

**2. Claim Rejections - 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

4. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1,4 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Czaja USPN 6424631.

6. As per claim 1, Czaja teaches a channel spreading method in a CDMA (Code Division Multiple Access) (Czaja fig. 7: 722, col. 1 line 14) communication system which spreads a pair of symbols obtained by repeating a first symbol (Czaja fig. 6B: 622, S1 is repeated) with a quasi-orthogonal code (Czaja col. 1 paragraph 2 "In CDMA<sub>s</sub> each user signal includes a different orthogonal code and a pseudo-random binary sequence that modulate a carrier, spreading the spectrum of the waveform ... ") having a given length (inherent) to transmit the spread symbols through a first antenna (Czaja fig. 7: 702) and spreads a second symbol (Czaja fig. 6B: S2 in 622) and an inverted symbol of said second symbol (Czaja fig. 6B 622: S3 is an inverted symbol of S2) obtained by repeating said second symbol (Czaja fig. 6B 622: S2 is repeated and S3 is after S2) with said quasi-orthogonal code (Czaja col. 1 paragraph 2 "In CDMA<sub>s</sub> each user signal includes a different orthogonal code and a pseudo-random binary sequence that modulate a carrier, spreading the spectrum of the waveform ... ") to transmit the spread symbols through a second antenna (Czaja does not show two antennas in fig. 7. It only shows one antenna. It would have been obvious to one having ordinary skill in the art at the time the invention was

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made to have a duplicate antenna, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.) at the same time, the method comprising the steps of: spreading one of said pair of symbols obtained by repeating said first symbol (Czaja fig. 6B: 622, S1 is repeated) with a portion of said quasi-orthogonal code (Czaja col. 1 paragraph 2 "In CDMA, each user signal includes a different orthogonal code ...", since there are many users, the code will be long and so only a portion of the code can spread the first symbol) and spreading another symbol of said pair of symbols with a remaining portion of said quasi-orthogonal code (Czaja: since only a portion of the orthogonal code will spread the first symbol, the remainder of the code will spread other symbols.); and spreading the second symbol with a portion of said quasi-orthogonal code (Czaja col. 1 paragraph 2 "In CDMA, each user signal includes a different orthogonal code ...", since there are many users, the code will be long and so only a portion of the code can spread one symbol) and spreading said inverted symbol of said second symbol with the remaining portion of said quasi-orthogonal code (Czaja: since only a portion of the orthogonal code will spread one symbol, the remainder of the code will spread other symbols.).

7. As per claim 4, Czaja teaches a channel spreading device in a CDMA communication system having first and second antennas to perform an orthogonal transmit diversity function, comprising: a first transmitter having a first spreader for spreading a pair of symbols obtained by repeating a first symbol with a quasi-orthogonal code having a given length to transmit the spread symbols through a first antenna, spreading one of said pair of symbols with a portion of said quasi-orthogonal code and spreading another symbol of said pair of symbols with a

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remaining portion of said quasi-orthogonal code; and a second transmitter having a second spreader for spreading a second symbol and an inverted symbol of said second symbol obtained by repeating said second symbol with said quasi-orthogonal code to transmit the spread symbols through a second antenna, spreading said second symbol with a portion of said quasi-orthogonal code and spreading said inverted symbol of said second symbol with the remaining portion of said quasi orthogonal code. (reject based on discussion in claim 1)

8. As per claim 7, Czaja teaches a channel spreading method in a CDMA (Code Division Multiple Access) communication system comprising the steps of: duplicating a first input symbol to create a first pair of symbols (Czaja fig. 6B 622 has S1 repeated); matching a second input symbol (Czaja fig. 6B 622 first S2) with its complement (Czaja fig. 6B 622 second S2) to create a second pair of symbols; spreading the first pair of symbols by a first quasi-orthogonal code in order to transmit the spread first pair of symbols through a first antenna; and spreading the second pair of symbols by a second quasi-orthogonal code in order to transmit the spread second pair of symbols through a second antenna. (remainder discussed above with claim 1)

9. As per claim 8, Czaja teaches the channel spreading method in claim 7 wherein the first and second quasi-orthogonal codes are the same (Czaja: since in a CDMA system, there will be multiple users each with a different code, if both the first and second symbol belong to the same user, they will be spread with the same code).

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10. As per claim 9, Czaja teaches the channel spreading method in claim 7 wherein the first and second quasi-orthogonal codes are different (Czaja: since in a CDMA system, there will be multiple users each with a different code, if both the first symbol belongs to a different user than the second symbol, then the two symbols will be spread with different codes).

11. As per claim 10, Czaja teaches the channel spreading method in claim 7 wherein one of the first pair of symbols (Czaja fig. 6B 622 first S1) is spread by a portion of the first quasi-orthogonal code (Czaja col. 1 paragraph 2 “In CDMA<sub>s</sub> each user signal includes a different orthogonal code ...”, since there are many users, the code will be long and so only a portion of the code can spread one symbol) and other of the first pair of symbols (Czaja fig. 6B 622 second S1) is spread by the remaining portion of the first quasi-orthogonal code (Czaja col. 1 paragraph 2 “In CDMA<sub>s</sub> each user signal includes a different orthogonal code ...”, since there are many users, the code will be long and so only a portion of the code can spread one symbol).

12. As per claim 11, Czaja teaches the channel spreading method in claim 7 wherein one of the second pair of symbols (Czaja fig. 6B 622 first S2) is spread by a portion of the second quasi-orthogonal code (Czaja col. 1 paragraph 2 “In CDMA<sub>s</sub> each user signal includes a different orthogonal code ...”, since there are many users, the code will be long and so only a portion of the code can spread one symbol; if both the first and second symbol belong to the same user, both codes will be the same; if both the first symbol belongs to a different user than the second symbol, then the two symbols will be spread with different codes) and other of the second pair of

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symbols (Czaja fig. 6B 622 second S2) is spread by the remaining portion of the second quasi-orthogonal code.

**13. Allowable Subject Matter**

14. Claims 2, 3, 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The art of record does not suggest the respective claim combinations together and nor would the respective claim combinations be obvious with the underlined portion:

15. (object) As per claim 2, Czaja teaches the channel spreading method as claimed in claim 1, wherein the quasi orthogonal code spreading step comprises the step of mixing one symbol with a chip signal of a first half period of the quasi-orthogonal code (not in Czaja) and mixing another symbol with a chip signal of a second half period of the quasi-orthogonal code, so as to spread two symbols for duration of one quasi-orthogonal code.

16. Claims 3 is objected to since claim 3 depends on objected claim 2.

17. As per claim 5, Czaja teaches the channel spreading device as claimed in claim 4, wherein each of the first and second spreaders mixes one symbol with a chip signal of a first half period of the quasi-orthogonal code (not in Czaja) and mixes another symbol with a chip signal

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of a second half period of the quasi-orthogonal code, so as to spread two symbols for duration of one quasi-orthogonal code.

18. Claims 6 is objected to since claim 6 depends on objected claim 5.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

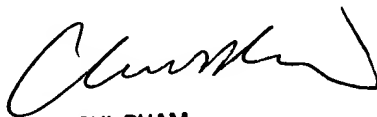
Park USPN 6400703

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (703) 305-0194. The examiner can normally be reached on Monday through Thursday after 8AM to after 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H. Pham can be reached on (703) 305-4378. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

PK  
January 22, 2003

  
CHI PHAM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600 1/24/03